

Abstract

An optically amplified wavelength division multiplexing network has the functionality to add/drop channels at the optical add/drop multiplexing (OADM) nodes. The OADM node includes a receiver amplifier, an OADM module, and a transmitter amplifier. Once the OADM node detects a loss of signal (LOS) due to a fiber cut or network element failure upstream, the receiver amplifier is kept in operation as a noise source. The output of the receiver amplifier is immediately raised by increasing pump power to compensate for the LOS. The noise power received at the transmitter amplifier from the receiver amplifier is substantially equal to the signal power expected before LOS. The transient effect of downstream optical amplifiers is therefore completely suppressed and the inter-channel stimulated Raman scattering (SRS) induced spectrum tilt does not change. After the noise power is raised, the receiver amplifier may be shut down at a speed much slower than the speed of downstream amplifier control circuitry.